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Selective residential mobility and social influence in the emergence of neighborhood personality differences: Longitudinal data from Australia

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Abstract

This study examined the role of selective residential mobility and differential personality development in the emergence of associations between personality and two neighborhood characteristics: urban–rural residence and neighborhood affluence. Participants were 19,665 individuals from the longitudinal Household, Income and Labour Dynamics in Australia (HILDA) study with personality traits assessed in 2005, 2009, and 2013. Urban and more affluent neighborhoods were both characterized by higher openness to experience, extraversion, conscientiousness, and agreeableness. Overall, selective residential mobility was more important for urban–rural differences whereas both selective residential mobility and social influence contributed to correlations with neighborhood affluence. Simulated data based on the regression models produced correlations that very close to the empirical correlations, suggesting that the empirical correlations could feasibly emerge within a 30-year period.

Keywords: Personality development, Selection, Neighborhood, Longitudinal

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1. Introduction

Studies in geographical psychology have shown that regionally averaged personality scores tend to cluster across geographic areas (Rentfrow & Jokela, 2016). Regions that are closer to each other geographically have more similar personality scores than regions that are further apart. This can be observed at different levels of geography, including states in the United States (Rentfrow, 2010), local authority districts in the United Kingdom (Rentfrow, Jokela, & Lamb, 2015), and postal districts in the metropolitan London area (Jokela, Bleidorn, Lamb, Gosling, & Rentfrow, 2015). The regional personality differences align with many social and economic correlates (Rentfrow & Jokela, 2016), such as historical circumstances (Obschonka, Stuetzer, Rentfrow, Shaw-Taylor, et al., 2017; Obschonka, Stuetzer, Rentfrow, Potter, & Gosling, 2017), economic growth (Garretsen, Stoker, Soudis, Martin, & Rentfrow, 2018), and political values (Rentfrow et al., 2013).

Regional differences in personality can develop via at least two processes (Rentfrow & Jokela, 2016). First, *selective residential mobility* may be operating if personality traits are involved in steering migration flows: depending on personality traits, different individuals may have different location preferences or motivations to move. Personality traits have been associated with migration patterns. A Finnish study showed higher sociability to predict rural-to-urban migration over 9 years (Jokela, Elovainio, Kivimäki, & Keltikangas-Järvinen, 2008). In the United States, higher openness to experience, higher extraversion, and lower agreeableness were related higher migration probability (Jokela, 2009). Other studies have reported similar findings on personality and selective residential mobility in Italy (Ciani & Capiluppi, 2011), Norway (Butikofer & Peri, 2017), and Australia (Campbell, 2019).

Second, *social influence* might be operating if people's personality development depends on their residential locations. It is plausible that neighborhood characteristics can influence people's personality development (Oishi et al., 2017; Oishi & Talhelm, 2012;

Talhelm et al., 2014) but there seems to be no studies that would have examined neighborhood characteristics and changes in the Five Factor Model personality traits. It is therefore unknown how much of the regional personality differences are driven by selective residential mobility versus differential personality development.

The current study used Australian longitudinal data with 3 measurement times over 8 years to examine the relative contributions of selective migration and social influence in creating personality differences associated with (a) urban vs. rural regions, and (b) socioeconomically affluent vs. deprived neighborhoods. After estimating the bidirectional associations between personality and neighborhoods, I carried out simple simulations to test how strong correlations between personality traits and neighborhood characteristics would emerge in simulated population of 20-year-olds for whom the processes of residential selection and neighborhood influence were applied over 40 years, based on the empirically estimated coefficients. The simulations provided a test of whether the combined effects of selective mobility and social influence would reach the empirically observed correlations between personality traits and neighborhood characteristics, and how many years this would be expected to take.

2. Method

2.1. Participants

The Household, Income and Labour Dynamics in Australia (HILDA; http://www.melbourneinstitute.com/hilda/) Survey is a household-based panel study developed to collect information about economic and subjective well-being, labor market dynamics and family dynamics. The survey began in 2001 with a large national probability sample of Australian households occupying private dwellings (n=7,682 households with 19,914 individuals at baseline). All members of the households providing at least one interview in

wave 1 formed the basis of the panel to be pursued in each subsequent wave. Interviews have been conducted annually with all adult members of each household, and the sample has been gradually extended to include any new household members resulting from changes in the composition of the original households. From wave 9, new household members that arrived in Australia for the first time after 2001 were also added to the sample. The association between personality and migration decision processes has been examined previously using the HILDA data (Campbell, 2019) but this study did not examine selective migration or personality development.

2.2. Measures

Personality was assessed in study wave 5 in 2005, wave 9 in 2009, and wave 13 in 2013, using a 36-item Five Factor Personality self-reported inventory based on the Saucier's and Goldberg's Big Five Markers Scale, with 8 items for extraversion (Cronbach α=0.77), 7 items for emotional stability (α=0.79), 7 items for agreeableness (α=0.77), 7 items for conscientiousness (α=0.79), and 6 items for openness to experience (α=0.73; the original item "traditional" was omitted from the scale because of a very low factor loading of 0.03 and a very low correlation of 0.02 between the item and a scale constructed from the rest of the items). The participants rated the items on a 7-point scale (1=Does not describe me at all, 7=Describes me very well). Personality mean scores were calculated for individuals with no more than 1 missing item in the scale, and then multiplied by the number of items of the scale to have the same range as personality sum scores would have had.

Education (coded as 1=primary, 2=secondary, 3=tertiary), parenthood status (0=no children, 1=children), marital status (0=not married/cohabiting, 1=married/cohabiting), and employment status (0=employed, 1=not employed, 2=not in labor market).

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Neighborhood characteristics were determined at the level of statistical local areas (SLA), which is the general-purpose spatial unit used to collect and disseminate statistics (n=1,353 SLAs in 2001). In years in which a census is not conducted, the SLA is the smallest unit defined in the Australian Standard Geographical Classification (see www.abs.gov.au for details of geographic hierarchy). The median population count of SLAs was 5,908 (interquartile range 2,743 to 14,517), and the median area size was 74.5 km2 (interquartile range, 7.5 to 1,944.0). Household addresses of participants were geocoded at each wave, and the participants' SLAs were determined from these data. Two neighborhood indicators were derived from 2001 census data. *Neighborhood affluence* was determined based on the decile index of relative socioeconomic advantage/disadvantage as calculated using the Socio-Economic Indexes for Areas indicators. The index is a continuum of advantage to disadvantage, and it takes into account variables such as the proportion of families with high incomes, people with a tertiary education, and people employed in a skilled occupation. For the present analysis, the scale was coded so that higher scores indicated higher neighborhood affluence. *Urban vs. Rural Residence* was measured using Accessibility/Remoteness Index of Australia. Remoteness is determined on the basis of accessibility to various services, that is, a weighted score of road distances to "service centers" with smaller and larger populations. The scale ranges from 1 for a major city (indicating relatively unrestricted access to a wide range of goods and services and to opportunities for social interaction) to 5 for a very remote/migratory area (indicating very little accessibility of goods and services and few opportunities for social interaction). For the present analysis, I categorized remoteness into urban (i.e., major cities) versus rural (i.e., inner regional, outer regional, remote, and very remote locations) residential areas.

2.3. Statistical methods

Cross-sectional associations between neighborhood characteristics and personality traits were assessed with Pearson correlations (separate associations by personality traits) and multilevel regression models (mutually adjusted associations). For all analyses, personality traits scores were standardized using the means and standard deviations in 2005, and all regression coefficients are reported for standardized personality scores. To examine selective residential mobility predicted by personality traits, I used logistic regression (for urban–rural) and multinomial logistic regression (for neighborhood affluence) to predict the probability of moving to a different location. Personality assessed in 2005 was used to predict all moves between 2005 and 2009, and personality assessed in 2009 to predict all moves between 2009 and 2013. The data were structured into annual person-year observations, and mobility was determined as changes between consecutive years. All models were adjusted for sex and age, and robust estimator was used to calculate standard errors in order to adjust for the non-independence of repeated person-observations from the same individuals. For urban–rural difference, separate logistic regressions were carried out for (1) those living in a rural area, the outcome variable being 0=no move to urban area, and 1=move to an urban area, and (2) those living in an urban area, the outcome variable being 0=no move to rural area, and 1=move to rural area. For the multinomial logistic regression, the outcome variable was coded as 0=no change in affluence, 1=move to a less affluent neighborhood, 2=move to a more affluent neighborhood, and the models were further adjusted for current level of neighborhood affluence. These models were further adjusted for the socioeconomic factors.

For the analysis of personality change, I used multilevel regression models to estimate how personality change over the three measurement times was related to the person's residential locations during the follow-up. I calculated the average urban/rural residence and neighborhood affluence across all the available measurement times from 2005 to 2013 and used them and their interaction effects with age as the predictor variables in separate

regression models, further adjusted for the interaction effect between baseline age and follow-up time. I was interested only in the interaction effect with age that indicated whether the neighborhood measures were associated with developmental trajectories in personality traits over time, and I used fixed-effect regression in order to take into account only within-individual changes. These models provided estimates of how much personality scores changed in different residential locations.

Finally, I ran simple simulations to estimate the degree and the relative importance of selective migration and social influence in creating personality differences across neighborhoods. Each simulation began with a population of 10,000 individuals whose personality scores were derived from a multivariate normal distribution in which the traits were correlated as they were correlated in the empirical data. The participants' neighborhood characteristics were randomly assigned using probability distributions similar to the empirical data (i.e., 60% living in an urban area, and uniform distribution across affluence deciles). To model life-course trajectories of the individuals, I set everyone's age 20 years at the beginning, and allowed the simulation to run for 40 years. Sex was set to 1.5 (representing equal number of men and women but excluding the influence of sex from the simulation). The simulation proceeded in 1-year steps so that the participants' age increased by 1 year, and changes in neighborhood characteristics and personality scores were modelled using the empirically estimated regression equations for selective mobility and social influence. In addition, I run the simulations by allowing only selection or influence to operate, which provided estimates for the relative importance of these mechanisms. To determine confidence intervals for the simulated correlations, I bootstrapped the regression models with 200 repetitions and calculated the simulations across these estimates; in each of the bootstrapped sample the statistically non-significant regression coefficients were set to zero. For selective mobility across affluence deciles, I first used the multinomial regression models to determine

whether the simulated individuals moved to less or more affluent neighborhoods, and then determined the number of deciles moved using ordered logistic regression models with personality and age as the predictor variables.

3. Results

Table 1 shows the descriptive statistics of the sample. In cross-sectional multilevel logistic regression models with all personality traits, age, and gender as predictors, urban vs rural residence was associated with openness to experience (B=0.23; 0.11, 0.36) and agreeableness (B=0.23; 0.10, 0.36) but not with extraversion (B=0.08; -0.04, 0.21), emotional stability (B=-0.10; -0.22, 0.03) and conscientiousness (B=0.09; -0.03, 0.22). Across the 94,236 person-observations of 18,272 persons, there were 1,027 rural-to-urban and 1,052 urban-to-rural moves. Adjusted for other personality traits, higher openness to experience, conscientiousness, and extraversion predicted rural-to-urban migration but none of the personality traits predicted urban-to-rural migration (**Table 2**). Adjusting for sociodemographic covariates attenuated the association of openness to experience by one-third.

In cross-sectional multilevel linear regression models with all personality traits, age, and gender as predictors, higher neighborhood affluence was associated with openness to experience (B=0.18; 95% CI=0.15, 0.21), extraversion (B=0.06; 0.03, 0.08), emotional stability (B=0.09; 0.06, 0.11), conscientiousness (B=0.07; 0.04, 0.10) but not with agreeableness (B=-0.01; -0.04, 0.02). Across the 94,227 person-observations of 18,270 persons, there were 5,340 moves to more affluent neighborhoods and 5,412 moves to less affluent neighborhoods. Adjusted for the other personality traits, higher openness to experience and extraversion were predictive of moves to more affluent neighborhoods, and lower emotional stability, higher agreeableness, and higher extraversion were predictive of

moves to less affluent neighborhoods (**Table 3**). Adjusting for the covariates did not considerably change these associations.

The associations between neighborhood characteristics and personality development are shown in **Table 4**. Urban–rural residence during the follow-up period was not associated with differences in personality development. Neighborhood affluence was associated with accelerated increase in agreeableness, and decelerated decrease in openness to experience over time.

Figures 1 and **2** show the emergence of correlations between personality traits and neighborhood characteristics in simulations as a result of selective residential mobility and differential personality development reported in **Tables 2** to **4** (see **Supplementary Figures 1** and **2** for simulation results based on only selective residential mobility or personality development). Residential mobility became less likely after age 40, which is why most of the neighborhood correlations emerged between ages 20 and 40. **Table 5** reports the simulated correlations at age 45 and the empirical correlations in the total dataset (mean age = 44.5 years). The correlations from the simulations were very close to the empirical correlations. For example, openness to experience had an empirical correlation of 0.08 and simulated correlation of 0.10 with urban–rural residence, and an empirical correlation of 0.13 and simulated correlation of 0.12 with neighborhood affluence.

4. Discussion

The current results suggest that the contributions of selective residential mobility and differential personality development on neighborhood variation in personality traits depends on the measures of neighborhood characteristics. More urban and affluent neighborhoods were characterized by higher openness to experience, conscientiousness, agreeableness, and extraversion; neighborhood affluence was also related to higher emotional stability. Urban–

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rural difference was not related to personality development, and all the urban–rural correlations could be produced in a simulation that included only the estimates for selective rural-to-urban migration associated with openness to experience, conscientiousness, and agreeableness. Neighborhood affluence favored the development of openness to experience and agreeableness. Openness to experience, extraversion, and emotional stability were related to selective residential mobility towards more affluent neighborhoods.

Previous studies have associated residential mobility with higher openness to experience and extraversion (Ciani & Capiluppi, 2011; Jokela, 2009). In the current study, these traits were predictive of selective residential mobility to more urban and affluent neighborhoods. Individuals with higher openness to experience and extraversion may derive more life satisfaction and positive affect from living in affluent and densely populated neighborhoods—compared to individuals with low openness to experience and extraversion (Jokela et al., 2015)(Murray et al., 2005). This "wellbeing premium" of urban areas for open-minded and extraverted individuals could therefore explain why these individuals tend to move to urban and affluent neighborhoods. Somewhat surprisingly, none of the personality traits predicted selective mobility from urban to rural areas, even though the overall rates of rural-to-urban and urban-to-rural migrations were almost the same. Urban-to-rural migration in Australia may be driven by other factors besides personality differences.

Higher conscientiousness also predicted an higher rate of rural-to-urban migration but not migration across affluent vs deprived neighborhoods. Higher conscientiousness is characterized by higher achievement seeking and higher socioeconomic status (Damian, Su, Shanahan, Trautwein, & Roberts, 2015), so the association with rural-to-urban migration may be related to highly conscientious people's career strivings, for which cities offer more opportunities. In a British study, higher conscientiousness was associated with a stronger link between migration intentions and actual moves: higher conscientiousness was associated with

higher probability of moving among those who had intentions to move and lower migration probability among those with no migration intentions (Jokela, 2014b). An Australian study using the same HILDA data as the current study observed a similar moderator effect for conscientiousness (Campbell, 2019). Thus, higher conscientiousness may increase residential mobility by making it more likely that people actually move when they have the intention to move.

Regarding personality development, living in affluent vs deprived neighborhoods throughout the follow-up period was associated with trajectories of higher openness to experience and agreeableness. Affluent neighborhood provide more economic resources, social cohesion, stability, and safety, and they may also provide more cognitive stimulation and social interaction, thereby fostering socially adaptive personality development (Pepper & Nettle, 2017). By contrast, neighborhood deprivation has been associated with various poor health and social outcomes (Chetty & Hendren, 2018; Oakes, Andrade, Biyoow, & Cowan, 2015), although the evidence for causal neighborhood effects is still mixed (Jokela, 2014a, 2015), which is likely to hamper the development of agreeable and open-minded personality development. Urban residence, on the other hand, was not associated with developmental trajectories of personality traits.

The current analysis examined how neighborhood-level characteristics were associated with individual-level personality rather than regionally averaged personality. The correlations were small, and the associations between neighborhood characteristics and their residents' personality traits should obviously not be overemphasized. However, even small effect sizes may have important consequences on regional development over the long term, as the effects accumulate over time.

The empirically observed correlations between personality traits and neighborhood characteristics could be closely reproduced in simulated data using the regression coefficients

for selective residential mobility and differential personality development. The absolute levels of migration decreased considerably after age 40, so most of the neighborhood differences caused by selective mobility developed between ages 20 and 40. This suggests that the observed neighborhood differences in personality could be explained by these two processes without a need to consider other factors that would be needed to account for discrepancies between empirical and simulated correlations. For neighborhood affluence, differential personality development was allowed to continue throughout the simulation, which probably leads to overestimation of social influence: any effects of neighborhood affluence on adult personality development is likely to taper off at some point, but the current analysis could not determine this timing in more detail. Of course, the simulations were very simple and did not consider many factors that are relevant for regional patterns, including employment, family status, age structure, births, deaths (Kley, 2011). These sociodemographic factors might modify the personality associations, or help to explain the associations between personality and residential mobility (e.g., parenthood or unemployment might influence both personality development and residential mobility). More detailed simulations are needed to better match behaviors of individuals and the resulting population-level patterns.

In sum, the current results suggest that neighborhood differences in personality can develop via selective residential mobility and differential personality development related to neighborhoods. The relative importance of these processes depends on the specific measure of neighborhood characteristics. Simulation models can be used to further evaluate the social significance of personality associations.

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Declaration of interest

None

Open practices

This study was not pre-registered. The HILDA dataset is available for all researchers (https://melbourneinstitute.unimelb.edu.au/hilda) but cannot be re-distributed by the author.

Appendix A. Online supplementary Material

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FIGURE CAPTIONS

Figure 1. Simulated development of correlations between urban–rural residence and individuals' personality traits as a result of selective residential mobility and differential personality development (**Tables 2** to **4**).

Figure 2. Simulated development of correlations between neighborhood affluence and individuals' personality traits as a result of selective residential mobility and differential personality development (**Tables 2** to **4**).

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Table 1. Descriptive statistics

	Wave 5	Wave 9	Wave 13
Extraversion*	4.44 (1.07)	4.44 (1.06)	4.44 (1.08)
Emotional stability*	5.17 (1.09)	5.23 (1.07)	5.17 (1.09)
Agreeableness*	5.37 (0.94)	5.34 (0.93)	5.44 (0.92)
Conscientiousness*	5.08 (1.04)	5.06 (1.02)	5.11 (1.03)
Openness to experience*	4.22 (1.06)	4.16 (1.08)	4.25 (1.07)
Age*	44.0 (18.1)	44.4 (18.5)	44.9 (18.7)
Neighborhood affluence*	5.53 (2.90)	5.58 (2.87)	5.55 (2.87)
Remoteness			
Major city	6928 (61.2)	7027 (61.6)	9657 (63.5)
Inner regional	2884 (25.5)	2844 (24.9)	3684 (24.2)
Outer regional	1286 (11.4)	1303 (11.4)	1649 (10.8)
Remote	171 (1.5)	188 (1.6)	184 (1.2)
Very remote	45 (0.4)	43 (0.4)	36 (0.2)
Gender			
Men	5284 (46.7)	5326 (46.7)	7100 (46.7)
Women	6030 (53.3)	6079 (53.3)	8110 (53.3)
Employment status			
Employed	3967 (35.1)	4033 (35.4)	5659 (37.2)
Other	7347 (64.9)	7372 (64.6)	9551 (62.8)
Marital status			
Married/Cohabiting	4608 (40.7)	4709 (41.3)	6070 (39.9)
Living alone	6706 (59.3)	6690 (58.7)	9134 (60.1)
Parenthood status			
No children	7137 (63.1)	7239 (63.5)	9683 (63.7)
Has children	4177 (36.9)	4166 (36.5)	5527 (36.3)
Education level			
Primary	3968 (35.1)	3580 (31.4)	4312 (28.3)
Secondary	4990 (44.1)	5265 (46.2)	7091 (46.6)
Tertiary	2356 (20.8)	2560 (22.4)	3807 (25)

Note: Values are numbers (and percentages) unless otherwise noted. * Values are means (and standard deviations).

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Table 2. Baseline personality traits predicting rural-to-urban and urban-to-rural selective residential mobility

A. Rural-to-urban migration (n = 1,021 moves)†			
	Individual traits	Mutually adjusted traits	Fully adjusted
Extraversion	**1.10 (1.02, 1.18)**	**1.09 (1.02, 1.18)**	**1.11 (1.03, 1.20)**
Emotional stability	0.98 (0.91, 1.04)	0.99 (0.92, 1.06)	0.95 (0.88, 1.02)
Agreeableness	1.04 (0.97, 1.11)	0.94 (0.87, 1.01)	0.95 (0.88, 1.03)
Conscientiousness	**1.10 (1.02, 1.18)**	**1.09 (1.01, 1.18)**	**1.11 (1.02, 1.20)**
Openness to Experience	**1.21 (1.13, 1.30)**	**1.22 (1.13, 1.32)**	**1.13 (1.04, 1.22)**

B. Urban-to-urban migration (n = 1,046 moves)‡			
	Individual traits	Mutually adjusted traits	Fully adjusted
Extraversion	0.99 (0.93, 1.06)	1.00 (0.93, 1.07)	1.01 (0.94, 1.08)
Emotional stability	0.99 (0.93, 1.06)	0.98 (0.91, 1.06)	0.99 (0.92, 1.06)
Agreeableness	0.95 (0.89, 1.02)	0.95 (0.88, 1.02)	0.94 (0.87, 1.02)
Conscientiousness	1.03 (0.96, 1.10)	1.05 (0.98, 1.13)	1.08 (1.00, 1.16)
Openness to Experience	0.96 (0.90, 1.02)	0.97 (0.90, 1.04)	0.96 (0.90, 1.04)

Values are odds ratios (and 95% confidence intervals) of logistic regressions, adjusted for gender and age. Models A include only participants living in rural areas, models B include only participants living in urban areas. Reference category is not moving across follow-up waves. The first column shows the associations when the traits were assessed in separate models and the second column shows the mutually adjusted associations. The fully adjusted model includes all personality traits, education level, marital status, parenthood status, employment status, and household income. Standard errors were estimated using robust estimators with the person as the clustering variable. Statistically significant ($p<0.05$) associations are shown in bold font.

† n = 36,195 person-observations of 7,517 persons

‡ n = 58,066 person-observations of 12,080 persons

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Table 3. Personality traits predicting selective residential mobility to less or more affluent neighborhoods compared to not moving

A. To more affluent neighborhood (n = 5,340 moves)			
	Individual traits	Mutually adjusted traits	Fully adjusted
Extraversion	**1.08 (1.04, 1.11)**	**1.07 (1.04, 1.11)**	**1.08 (1.05, 1.12)**
Emotional stability	**0.97 (0.94, 1.00)**	0.98 (0.95, 1.02)	**0.97 (0.93, 1.00)**
Agreeableness	**1.04 (1.01, 1.08)**	0.99 (0.95, 1.02)	0.99 (0.96, 1.03)
Conscientiousness	1.02 (0.99, 1.06)	1.01 (0.98, 1.05)	1.01 (0.98, 1.05)
Openness to Experience	**1.14 (1.10, 1.17)**	**1.13 (1.09, 1.17)**	**1.07 (1.04, 1.11)**

B. To less affluent neighborhood (n = 5,412 moves)			
	Individual traits	Mutually adjusted traits	Fully adjusted
Extraversion	1.02 (0.99, 1.05)	**1.03 (1.00, 1.07)**	**1.04 (1.01, 1.08)**
Emotional stability	**0.92 (0.89, 0.95)**	**0.92 (0.89, 0.95)**	**0.92 (0.89, 0.96)**
Agreeableness	1.03 (0.99, 1.07)	**1.04 (1.00, 1.08)**	1.04 (1.00, 1.08)
Conscientiousness	**0.97 (0.94, 1.00)**	0.97 (0.94, 1.01)	1.01 (0.97, 1.04)
Openness to Experience	**1.03 (1.00, 1.07)**	1.00 (0.97, 1.04)	0.98 (0.95, 1.02)

Values are odds ratios (and 95% confidence intervals) of multinomial logistic regressions, adjusted for gender, age, and baseline remoteness. The reference category is not moving across neighborhood affluence categories during the follow-up waves (n = 83,475 person-observations). The first column shows the associations when the traits were assessed in separate models and the second column shows the mutually adjusted associations. The fully adjusted model includes all personality traits, education level, marital status, parenthood status, employment status, and household income. Standard errors were estimated using robust estimators with the person as the clustering variable. Statistically significant ($p<0.05$) associations are shown in bold font.

N = 94,227 person-observations of 18,270 persons

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Table 4. Within-individual personality development trajectories associated with living in urban vs. rural and affluent vs deprived neighborhoods

	Time	Time x Baseline age	Time x Residence
Urban vs rural residence			
Extraversion	**-0.12 (-0.17, -0.08)**	**0.02 (0.01, 0.03)**	0.02 (-0.02, 0.06)
Emotional stability	**0.15 (0.10, 0.20)**	-0.01 (-0.02, 0.01)	0.00 (-0.05, 0.05)
Agreeableness	**0.21 (0.15, 0.26)**	**-0.04 (-0.05, -0.02)**	-0.02 (-0.07, 0.03)
Conscientiousness	**0.34 (0.29, 0.39)**	**-0.08 (-0.10, -0.07)**	-0.01 (-0.06, 0.03)
Openness to Experience	-0.01 (-0.06, 0.03)	-0.01 (-0.02, 0.00)	0.02 (-0.02, 0.07)
Neighborhood affluence			
Extraversion	**-0.12 (-0.17, -0.07)**	**0.02 (0.01, 0.03)**	0.02 (-0.05, 0.08)
Emotional stability	**0.18 (0.12, 0.23)**	-0.01 (-0.02, 0.00)	-0.05 (-0.13, 0.02)
Agreeableness	**0.15 (0.09, 0.21)**	**-0.03 (-0.05, -0.02)**	**0.08 (0.00, 0.16)**
Conscientiousness	**0.31 (0.26, 0.36)**	**-0.08 (-0.10, -0.07)**	0.03 (-0.04, 0.10)
Openness to Experience	**-0.07 (-0.12, -0.01)**	-0.01 (-0.02, 0.00)	**0.12 (0.05, 0.20)**

Values are coefficients (and 95% confidence intervals) of fixed-effect multilevel regression models fitted separately by personality trait and neighborhood indicator (10 models in total). Personality traits were standardized using baseline means and standard deviations. One unit of time equals 10 years, one unit of baseline age equals 5 years (centered at age 20), and 1 unit of residence equals the difference between lowest and highest values of residence over the follow-up period. n=27,585 person-observations of 11,415 persons.

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Table 5. Simulated and empirical correlations between neighborhood characteristics and personality traits

	Simulated data*			Empirical correlation†
	Selective migration	Social influence	Combined	
Rural–Urban Residence				
Extraversion	**0.04 (0.00, 0.08)**	0.01 (-0.02, 0.06)	**0.05 (0.00, 0.10)**	**0.02**
Emotional stability	-0.01 (-0.04, 0.03)	0.00 (-0.04, 0.04)	-0.01 (-0.07, 0.04)	0.00
Agreeableness	0.03 (-0.01, 0.08)	0.00 (-0.06, 0.02)	0.03 (-0.04, 0.08)	**0.03**
Conscientiousness	0.02 (-0.01, 0.06)	0.00 (-0.05, 0.02)	0.02 (-0.04, 0.08)	**0.03**
Openness to Experience	**0.09 (0.05, 0.13)**	0.00 (-0.02, 0.05)	**0.10 (0.05, 0.15)**	**0.07**
Neighborhood Affluence				
Extraversion	**0.05 (0.01, 0.07)**	0.00 (-0.02, 0.06)	**0.05 (0.02, 0.10)**	**0.06**
Emotional stability	**0.05 (0.02, 0.08)**	-0.01 (-0.07, 0.02)	0.04 (-0.03, 0.08)	**0.05**
Agreeableness	0.02 (-0.01, 0.05)	0.02 (-0.02, 0.07)	0.04 (-0.01, 0.10)	**0.05**
Conscientiousness	**0.05 (0.01, 0.08)**	0.00 (-0.02, 0.05)	**0.06 (0.02, 0.10)**	**0.07**
Openness to Experience	**0.07 (0.04, 0.10)**	**0.05 (-0.01, 0.09)**	**0.12 (0.06, 0.17)**	**0.13**

Note: Values are individual-level correlation coefficients (and their 95% confidence intervals). * The simulated correlations were determined by applying the regression coefficients of Tables 1 to 3 in simulated samples of 10,000 individuals, starting at age 20 (see Figures 1 and 2). The simulated correlations are reported for age 45 (after 25 simulated years). The confidence intervals were determined using bootstrapping (n=200). † Partial correlations adjusted for age and sex. Statistically significant associations ($p<0.05$) are shown in bold font.

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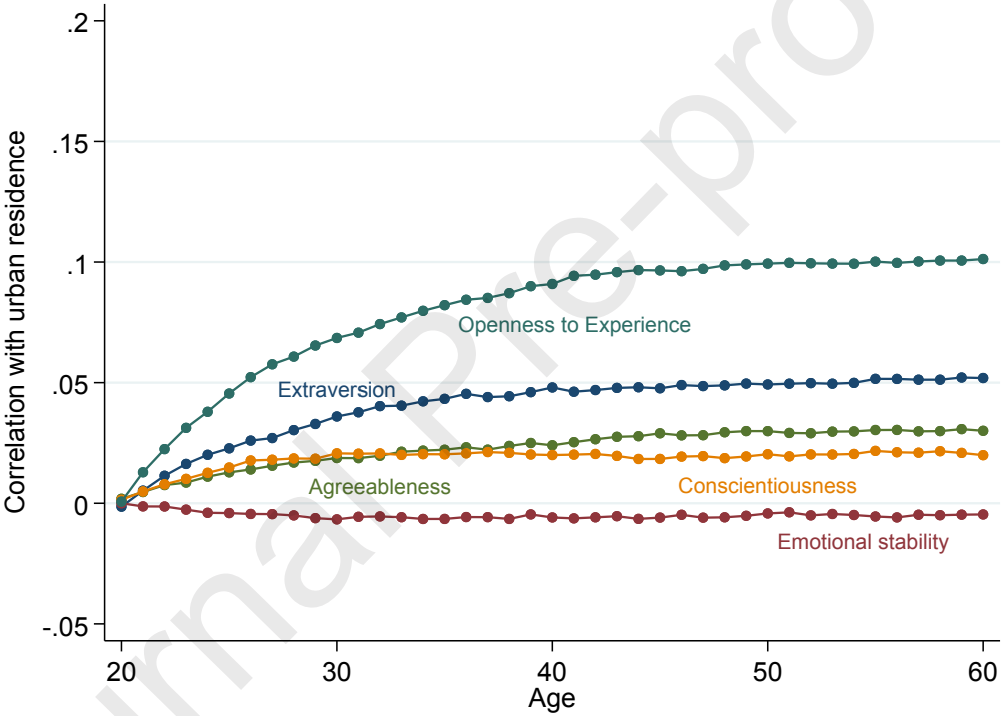

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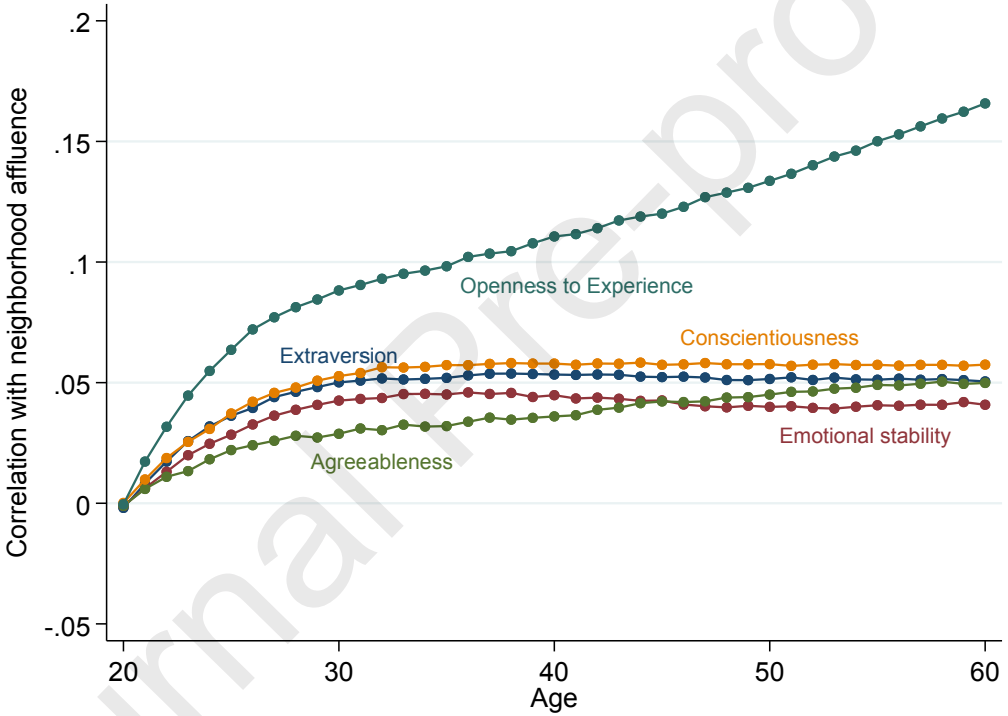

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Highlights

- Selective migration and social influence can explain neighborhood differences in personality
- Urban and affluent neighborhoods had higher openness to experience, extraversion, conscientiousness, and agreeableness
- Personality was associated with selective migration for urban–rural residence and neighborhood affluence
- Only neighborhood affluence was related to personality development

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